REMARKS

At the Examiner's suggestions (see the Office Action, "Specification" section, pages 2-3), Applicants have amended the specification by (1) deleting the "Cross Reference of Related Application" section at page 1, (2) fully capitalizing each trademark at pages 9-11 and providing its chemical name, (3) correcting two typographical errors ("hydro" should have read "hydroxy") at page 5, lines 8 and 9, and (4) deleting "1,4-bis(hydroxydimethyl)benzene" and "diphenylsilanediol" from the polyol compound list at page 9, lines 7-9. Further, Applicants have amended claims 2, 6, and 10-19 to promote clarity, and claim 4 to revise its dependency. No new matter has been introduced by these amendments.

Claims 1-19 are currently pending. Reconsideration of this application, as amended, is respectfully requested in view of the remarks below:

Rejection under 35 U.S.C. § 102(e)

Claims 1-3, 6-9, and 11-19 were rejected under 35 U.S.C. § 102(e), as being anticipated by U.S. Patent No. 5,986,018 to Yamaguchi et al. ("Yamaguchi") and/or U.S. Patent No. 6,023,547 to Tortorello ("Tortorello"). See the Office Action, Applicants respectfully traverse as follows:

Yamaguchi and Tortorello issued from applications filed on February 20, 1998 and June 9, 1997, respectively. By contrast, claims 1-3, 6-9, and 11-19 cover an invention that was conceived and reduced to practice prior to June 9, 1997, i.e., prior to the earlier filing dates of Yamaguchi and Tortorello. See the Declaration by Se-Lee Chang, a co-inventor, filed herewith. (A signed copy of this declaration will be field as soon as it becomes available.) A copy of relevant pages from an experimental report (as well as its English translation) is attached to the declaration as evidence that the subject matter covered by the rejected claims was invented prior to June 9, 1997.

Since the filing dates of Yamaguchi and Tortorello are both **later** than the date of the invention covered by claims 1-3, 6-9, and 11-19, Applicants submit that Yamaguchi and Tortorello can no longer be relied on as 102(e) art against these claims.

Claim 4 was rejected under 35 U.S.C. § 103(a) as being obvious over Yamaguchi or Tortorello in view of U.S. Patent No. 6,298,189 to Szum et al. ("Szum"). Applicants respectfully traverse as follows:

Claim 4, as amended, covers a resin composition for manufacturing optical fiber ribbon. The resin composition includes a polydimethylsiloxane-containing urethane acrylate oligomer, which is synthesized from a polyol compound, i.e., Hsi 2111 (a hydroxy-terminated polydimethylsiloxane), 1,3-bis(hydroxybutyl)tetramethyldisiloxane, 1,4-bis(hydroxypropyl)tetramethyldisiloxane, or a mixture thereof.

Yamaguchi discloses a resin composition containing dialkylpolysiloxane particles. The dialkylpolysiloxane particles were prepared from the diol compound α,ω-bis[3-(2'-hydroxyethoxy)propyl]-dimethylpolysiloxane. See, e.g., Examples SA-1, SA-2, SA-3, SA-4, UA-1, and UA-2 at columns 11-13. This diol compound significantly differs in structure from the polyol compounds recited in claim 4 in that it includes an ether group in each chemical moiety that includes the hydroxy group, i.e., HO-CH_2CH_2-**O**-$CH_2CH_2CH_2$-(hydroxyeth**oxy**propyl). By contrast, in the polyol compounds recited in claim 4, each chemical moiety that includes the hydroxy group (i.e., HO-$(CH_2)_n$-) does not further include an ether group. In other words, Yamaguchi does not teach or suggest any of the polyol compounds recited in claim 4.

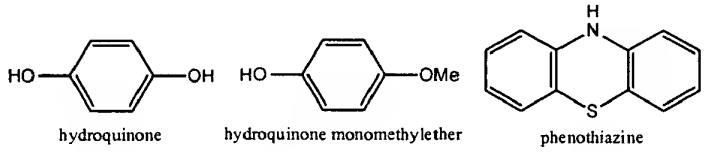
Tortorello discloses radiation curable compositions each containing a urethane oligomer having a polyester backbone. It teaches using polyols such as polyether diols, hydrocarbon diols, polycarbonate diols, polycaprolatone diols, ethylene glycol, and propylene glycol. See, e.g., column 8, lines 14-18; and column 9, lines 5-10. None of these diols is the same as or similar to the polyol compounds recited by claim 4. In other words, Tortorello does not teach or suggest any of the polyol compounds recited in claim 4.

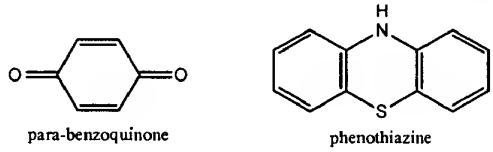
Szum, as correctly pointed out by the Examiner, discloses compositions for coating optical fibers. It teaches covalently incorporating a slip agent, such as a silicone, into various disclosed oligomers. See the Office Action, page 7, lines 13-17. Szum, however, is completely silent on using a polyol compound having a structure that is the same as or similar to those recited in claim 4.

Since none of Yamaguchi, Tortorello, and Szum teaches or suggests using a polyol compound recited in claim 4, neither does their combination. Thus, claim 4 is nonobvious over Yamaguchi or Tortorello in view of Szum.

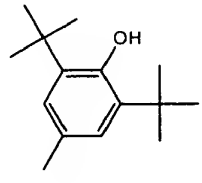
Claim 10 was also rejected under 35 U.S.C. § 103(a), as being obvious over Yamaguchi or Tortorello. Again, Applicants traverse as follows:

Claim 10 depends from claim 1 and, like claim 4, also covers a resin composition for manufacturing optical fiber ribbon. The composition includes a pohotopolymerizable urethane acrylate oligomer that is prepared in the presence of a polymerization inhibitor (i.e., hydroquinone, hydroquinone monomethylether, para-benzoquinone, phenothiazine, or a mixture thereof) and 0.01 to 1 weight% of the photopolymerizable urethane acrylate oligomer. Shown below are the structures of the polymerization inhibitors recited in claim 10:





Yamaguchi discloses using a 2,6-di-t-butyl-p-cresol as the inhibitor in preparing a urethane acrylate oligomer. See, e.g., Examples SA-1 to SA-3 and UA-1 to UA-2 at column 11, lines 29 and 50; column 12, lines 22 and 38; and column 13, line 5. Its structure is shown below:



Since 2,6-di-t-butyl-p-cresol is significantly different from the inhibitors recited in claim 10, claim 10 is clearly nonobvious over Yamaguchi.

Tortorello, as discussed above, discloses a radiation curable composition. It only generally states that "various additives may be added as required, such as antioxidatives, UV absorbers, photo-stabilizers, silane coupling agents; thermal polymerization inhibitors, leveling agent, coating surface improvers, surfactants, coloring matters...." See column 12, lines 21-26. This statement includes the only mention of "inhibitors" in Tortorello. Tortorello does not teach or suggest using any specific polymerization inhibitor, let alone any of those recited in claim 10. Thus, claim 10 is also nonobvious over Tortorello.

CONCLUSION

For the reasons stated above, Applicants submit that all claims, as amended, are now in condition for allowance, an action of which is requested. Attached is a marked-up version of the changes being made by the current amendment.

Pursuant to 37 CFR § 1.136, Applicants hereby petition that the period for response to the Office Action dated February 22, 2002, be extended for one month to and including June 24, 2002 (June 22 and 23, 2002 being a Saturday and a Sunday, respectively). Enclosed are a Petition of One-Month Extension of Time and a check for $110 for the required fee.

Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 6-24-02

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Version with markings to show changes made

In the specification:

The paragraph beginning at page 5, line 6 has been amended as follows:

(Amended) Preferably, the PDMS polyol is selected from the group consisting of Hsi 2111 (hydroxy-terminated polydimethylsiloxane, manufactured by Tego Chemical Company), [1,4-bis(hydroxydimethyl)benzene, 1,3-bis(hydrobutyl)tetramethyldisiloxane, 1,4-bis(hydropropyl)tetramethyldisiloxane,] 1,3-bis(hydroxybutyl)tetramethyldisiloxane, 1,4-bis(hydroxypropyl)tetramethyldisiloxane, [diphenylsilanediol,] and a mixture thereof, and is used in an amount of 5 to 25 weight% of the photopolymerizable urethane acrylate oligomer composition.

The paragraphs beginning at page 9, line 2 and ending at page 11, line 3 have been amended as follows:

(Amended) Furthermore, a photoinitiator of the present invention is added so as to make the resin cure quickly when the optical fiber coating is done at a fast line speed of 300 m/min or more. The photoinitiator forms free radicals by receiving ultraviolet energy, and it attacks double bonds in the resin thus induces polymerization. The photoinitiator is preferably selected from the group consisting of [Irgacure] IRGACURE #184 (1-hydroxy-cyclohexyl-phenyl-ketone, manufactured by CibaGeigy), [Irgacure] IRGACURE #907 (2-methyl-1((4-(methylthio)phenyl)-2-morpholinopropan-1-one, manufactured by CibaGeigy), [Irgacure] IRGACURE #500 (a mixture of IRGACURE # 184 and benzophenone, manufactured by CibaGeigy), [Irgacure] IRGACURE #651 (2,2-dimethoxy-1,2-diphenylethane-1-one, manufactured by CibaGeigy), [Darocure] DAROCURE #1173 (2-hydroxy-2-methyl-1-phenyl-propan-1-one, manufactured by Merk), [Darocure #116 (manufactured by Merk),] CGI #1800 (a mixture of bis(2,6-dimethoxybenzoyl)-2,4,4-trimethyl-phenyl-pentylphosphineoxide and IRGACURE # 184, manufactured by CibaGeigy), and CGI #1700 (a mixture of bis(2,6-dimethoxybenzoyl)-2,4,4-trimethyl-phenyl-pentylphosphineoxide and IRGACURE # 1173,

manufactured by CibaGeigy), and preferably comprises 3 to 15 weight% of the resin composition for manufacturing optical fiber ribbon.

Furthermore, the present invention comprises a leveling/defoaming agent, antioxidant, etc. as additives. Both silicone type and fluorine type additives can be used. Preferably, a silicone based additive is used in the present invention since a fluorine type additive generates a larger amount of bubbles than a silicone type additive does due to its low surface tension, and it is difficult to remove formed bubbles. There are two types of additives, including one type which comprises a molecular acrylate or vinyl group which participates in curing, and another type which emerges on the surface of the resin due to non-reactivity and thus exercises its effects. The material which plays a role as a leveling/defoaming agent is preferably selected from the group consisting of BYK #371 (an acrylated polydimethylsiloxane type leveling agent, manufactured by BYK Chemical Company), BYK #353 (a polyacrylate type leveling agent, manufactured by BYK Chemical Company), BYK #356 (a polyacrylate type leveling agent, manufactured by BYK Chemical Company), BYK #359 (a polyacrylate copolymer leveling agent, manufactured by BYK Chemical Company), BYK #361 (a polyacrylate copolymer leveling agent, manufactured by BYK Chemical Company), BYK #067 (a polysiloxane type defoaming agent, manufactured by BYK Chemical Company), BYK #141 (a polysiloxane type defoaming agent, manufactured by BYK Chemical Company), [Tego Rad] TEGO RAD #2200 (an acrylated polyester siloxane copolymer, manufactured by Tego Chemical Company), [Tego Rad] TEGO RAD #2500 (an acrylated polyester siloxane copolymer, manufactured by Tego Chemical Company), [Tego Rad] TEGO RAD #410 (a polyester siloxane copolymer, manufactured by Tego Chemical Company), [Tego Rad] TEGO RAD #435 (a polyester siloxane copolymer, manufactured by Tego Chemical Company), and [Tego Glide] TEGO GLIDE #453 (a polyester siloxane copolymer, manufactured by Tego Chemical Company), and preferably comprises 0.1 to 5 weight% of the resin composition for manufacturing optical fiber ribbon. Particularly, Tego Glide series are effective in providing surface slipping characteristics employed in the resin along with the silicone employed oligomer.

Furthermore, a phenol based additive is mainly used as an antioxidant which protects the physical properties of a formed film from being deteriorated due to corrosion caused by oxidation, and it is preferably used in an amount of about 0.1 to 5 weight% of the resin

composition for manufacturing optical fiber ribbon. More preferably, the antioxidant is selected from the group consisting of [Irganox] IRGANOX 1010 (pentaerythritol tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), manufactured by CibaGeigy), [Irganox] IRGANOX 1035 (pentaerythritol tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), manufactured by CibaGeigy), [Irganox] IRGANOX 1076 (octadecyl-3-(3,5-di-tert.butyl-4-hydroxyphenyl)-propionate, manufactured by CibaGeigy), and a mixture thereof.

In the claims:

Claims 2, 4, 6, and 10-19 have been amended as follows:

2. (Amended) A resin composition for manufacturing optical fiber ribbon according to claim 1, wherein the photopolymerizable urethane acrylate oligomer containing polydimethylsiloxane is synthesized [with a photopolymerizable urethane acrylate oligomer] from a composition comprising i) a first polyol compound containing polydimethylsiloxane structure, ii) a second polyol [copolymer] compound, iii) a polyisocyanate, iv) an acrylate alcohol, v) a urethane reaction catalyst, and vi) a polymerization [initiator] inhibitor.

4. (Amended) A resin composition for manufacturing optical fiber ribbon [according to claim 2, wherein the polyol compound containing polydimethylsiloxane is selected from the group consisting of Hsi 2111, 1,4-bis(hydroxydimethyl)benzene, 1,3-bis(hydrobutyl)tetramethyldisiloxane, 1,4-bis(hydropropyl)tetramethyldisiloxane, diphenylsilanediol, and a mixture thereof] comprising

a) a photopolymerizable urethane acrylate oligomer containing polydimethylsiloxane;

b) a monomer;

c) a photoinitiator;

d) a leveling/defoaming agent; and

e) an antioxidant;

wherein the photopolymerizable urethane acrylate oligomer containing polydimethylsiloxane is synthesized from a composition comprising

i) a first polyol compound containing polydimethylsiloxane structure and selected from the group consisting of HSI 2111 (hydroxy-terminated polydimethylsiloxane), 1,3-

bis(hydroxybutyl)tetramethyldisiloxane, 1,4-bis(hydroxypropyl)tetramethyldisiloxane, and a mixture thereof,

ii) a second polyol compound,

iii) a polyisocyanate,

iv) an acrylate alcohol,

v) a urethane reaction catalyst, and

vi) a polymerization inhibitor.

6. (Amended) A resin composition for manufacturing optical fiber ribbon according to claim 2, wherein the second polyol [copolymer] compound has a molecular weight of 100 to 10,000;[, comprises a repeat unit of -CH_2CH_2O- or -$CH_2CH(CH_2CH_3)O$-,] is selected from the group consisting of polyol including a repeat unit of -CH_2CH_2O- or -$CH_2CH(CH_2CH_3)O$-, polyester polyol, polyether polyol, polycarbonate polyol, polycaprolactone polyol, tetrahydrofuran propyleneoxide ring opening copolymer, ethylene glycol, propylene glycol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, neopentyl glycol, 1,4-cyclohexane dimethanol, bisphenol A, bisphenol F type diol, and a mixture thereof[,]; and comprises 5 to 30 weight% of the photopolymerizable urethane acrylate oligomer composition.

10. (Amended) A resin composition for manufacturing optical fiber ribbon according to claim 2, wherein the polymerization [initiator] inhibitor is selected from the group consisting of hydroquinone, hydroquinone monomethylether, para-benzoquinone, phenothiazine, and a mixture thereof[,]; and comprises 0.01 to 1 weight% of the photopolymerizable urethane acrylate oligomer composition.

11. (Amended) A resin composition for manufacturing optical fiber ribbon according to claim 1, wherein the monomer is selected from the group consisting of phenoxyethylacrylate, phenoxydiethylene glycol acrylate, phenoxytetraethylene glycol acrylate, phenoxyhexaethylene glycol acrylate, isobornyl acrylate, isobornyl methacrylate, N-vinylpyrrolidone, bisphenol ethoxylate diacrylate, ethoxylate phenol monoacrylate, polyethylene glycol 200 diacrylate, tripropylene glycol diacrylate, triethylpropane triacrylate, polyethyleneglycol diacrylate,

[ethylene oxide added type] ethoxylated triethylpropane triacrylate, pentaerythritol tetraacrylate, 1,4-butanediol diacrylate, 1,6-hexanediol diacrylate, ethoxylated pentaerythritol tetraacrylate, 2-phenoxyethyl acrylate, ethoxylated bisphenol A diacrylate, and a mixture thereof, and comprises 15 to 50 weight% of the resin composition for manufacturing optical fiber ribbon.

12. (Amended) A resin composition for manufacturing optical fiber ribbon according to claim 1, wherein the photoinitiator is selected from the group consisting of [Irgacure] IRGACURE #184 (1-hydroxy-cyclohexyl-phenyl-ketone), [Irgacure] IRGACURE #907 (2-methyl-1((4-(methylthio)phenyl)-2-morpholinopropan-1-one), [Irgacure] IRGACURE #500 (a mixture of IRGACURE # 184 and benzophenone), [Irgacure] IRGACURE #651 (2,2-dimethoxy-1,2-diphenylethane-1-one), [Darocure] DAROCURE #1173 (2-hydroxy-2-methyl-1-phenyl-propan-1-one), [Darocure #116,] CGI #1800 (a mixture of bis(2,6-dimethoxybenzoyl)-2,4,4-trimethyl-phenyl-pentylphosphineoxide and IRGACURE # 184), and CGI #1700 (a mixture of bis(2,6-dimethoxybenzoyl)-2,4,4-trimethyl-phenyl-pentylphosphineoxide and IRGACURE # 1173), and comprises 3 to 15 weight% of the resin composition for manufacturing optical fiber ribbon.

13. (Amended) A resin composition for manufacturing optical fiber ribbon according to claim 1, wherein the leveling/defoaming agent is selected from the group consisting of BYK #371 (an acrylated polydimethylsiloxane type leveling agent), BYK #353 (a polyacrylate type leveling agent), BYK #356 (a polyacrylate type leveling agent), BYK #359 (a polyacrylate copolymer leveling agent), BYK #361 (a polyacrylate copolymer leveling agent), BYK #067 (a polysiloxane type defoaming agent), BYK #141 (a polysiloxane type defoaming agent), [Tego Rad] TEGO RAD #2200 (an acrylated polyester siloxane copolymer), [Tego Rad] TEGO RAD #2500 (an acrylated polyester siloxane copolymer), [Tego Rad] TEGO RAD #410 (a polyester siloxane copolymer), [Tego Rad] TEGO RAD #435 (a polyester siloxane copolymer), and [Tego Glide] TEGO GLIDE #453 (a polyester siloxane copolymer), and comprises 0.1 to 5 weight% of the resin composition for manufacturing optical fiber ribbon.

14. (Amended) A resin composition for manufacturing optical fiber ribbon according to claim 1, wherein the antioxidant is selected from the group consisting of [Irganox] IRGANOX 1010 (pentaerythritol tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), [Irganox] IRGANOX 1035 (pentaerythritol tetrakis(3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate), [Irganox] IRGANOX 1076 (octadecyl-3-(3,5-di-tert.butyl-4-hydroxyphenyl)-propionate, and a mixture thereof, and comprises 0.1 to 5 weight% of the resin composition for manufacturing optical fiber ribbon.

15. (Amended) A [preparation] method of preparing resin for manufacturing optical fiber ribbon, comprising curing [in which] the [a] resin composition [for manufacturing the optical fiber ribbon] of claim 1 [is used] by photo irradiation.

16. (Amended) [A preparation] The method [of resin for manufacturing optical fiber] according to claim 15, wherein [a] the resin [for manufacturing optical fiber ribbon having] has 23 dyne/cm^2 or less surface tension and is prepared without the talc process for providing the surface slipping characteristics.

17. (Amended) A resin for manufacturing optical fiber ribbon, wherein the resin is manufactured by the method of claim 15.

18. (Amended) [A] The resin [for manufacturing optical fiber ribbon] according to claim 17, wherein the surface tension of the resin [for manufacturing optical fiber ribbon] is 23 dyne/cm^2 or less.

19. (Amended) [A] The resin [for manufacturing optical fiber ribbon] according to claim 17, wherein the resin [for manufacturing optical fiber ribbon] has a shrinkage of 7.2% or less when measured by an ASTM (American Society for Testing and Materials) D-792 method.